

WEPD – Type I [78, 39, 14]

This is a database of known weight enumerator parameters for singly-even binary self-dual [78, 39, 14] codes.

The possible weight enumerators of a singly-even binary self-dual [78, 39, 14] code are given in [2, 6] as

$$\begin{aligned}W_{78,1} &= 1 + (3705 + 8\alpha)x^{14} + (62244 - 24\alpha + 512\beta)x^{16} \\ &\quad + (774592 - 64\alpha - 4608\beta)x^{18} + \dots, \\ W_{78,2} &= 1 + (3705 + 8\alpha)x^{14} + (71460 - 24\alpha)x^{16} \\ &\quad + (658880 - 64\alpha)x^{18} + \dots,\end{aligned}$$

where $\alpha, \beta \in \mathbb{Z}$.

See the links below for lists of known values of (α, β) for $W_{78,1}$ and $W_{78,2}$.

- [W_{78,1} known parameters](#) (from [1–8])
- [W_{78,2} known parameters](#) (from [6])

References

- [1] A. Baartmans and V. Yorgov. Some new extremal codes of lengths 76 and 78. *IEEE Trans. Inform. Theory*, 49(5):1353–1354, 2003. doi: [10.1109/TIT.2003.810653](#).
- [2] S. T. Dougherty, T. A. Gulliver, and M. Harada. Extremal binary self-dual codes. *IEEE Trans. Inform. Theory*, 43(6):2036–2047, 1997. doi: [10.1109/18.641574](#).
- [3] P. Gaborit and A. Otmani. Experimental constructions of self-dual codes. *Finite Fields Appl.*, 9(3):372–394, 2003. doi: [10.1016/S1071-5797\(03\)00011-X](#).
- [4] J. Gildea, A. Kaya, A. Tylyshchak, and B. Yildiz. A modified bordered construction for self-dual codes from group rings. *J. Algebra Comb. Discrete Struct. Appl.*, 7(2):103–119, 2020. doi: [10.13069/jacodesmath.729402](#).
- [5] J. Gildea, A. Korban, A. M. Roberts, and A. Tylyshchak. Extremal binary self-dual codes from a bordered four circulant construction. *Discrete Math.*, 346(8), 2023. doi: [10.1016/j.disc.2023.113425](#).
- [6] T. A. Gulliver, M. Harada, and J.-L. Kim. Construction of new extremal self-dual codes. *Discrete Math.*, 263(1–3):81–91, 2003. doi: [10.1016/S0012-365X\(02\)00570-8](#).
- [7] N. Yankov and D. Anev. New self-dual [78, 39, 14] codes with an automorphism of order 13. “*Proceedings of the Eighth International Workshop on Optimal Codes and Related Topics*”, Sofia, Bulgaria, pages 128–133, 2017.
- [8] T. Zhang, J. Michel, T. Feng, and G. Ge. On the existence of certain optimal self-dual codes with lengths between 74 and 116. *Electron. J. Combin.*, 22(4), 2015. doi: [10.37236/5213](#).